



## MBT9600

### Four-Wire Modem for Teleprotection Applications For Power Line Carrier Communications

The MBT9600 is a high performance four-wire modem designed for use with Schweitzer Engineering Laboratories, Inc. protective relays, which use "Mirrored Bits" Relay-to-Relay logic communications. These relays use 9600 bps asynchronous communications as an integral part of mirrored bit logic for protection, monitoring and control.

Application specific features set the MBT9600 apart from conventional high speed modems. Conventional modems typically have retrain times in excess of 15 seconds and absolute<sup>1</sup> data delays of more than 25 milliseconds. These critical parameters make conventional modems unsuitable for most relaying applications.

The MBT9600's compact size and ease of installation make it an ideal low-cost alternative to conventional audio tone teleprotection systems. The circuitry is ideally suited for use over private networks such as conventional voice channels over analog microwave.

The MBT9600 is an environmentally hardened, dedicated four-wire modem, which meets or exceeds all applicable ANSI/IEEE and IEC standards.

#### FEATURES AND BENEFITS

- |   |  |
|---|--|
| 1 | Compact, mounts directly onto DB-9 connectors            |
| 2 | Serial port powered, no external power supplies utilized |
| 3 | Auto configuring – (no setup time)                       |
| 4 | Fast retrain times                                       |
| 5 | Low absolute <sup>1</sup> data delays                    |
| 6 | No user set-up required                                  |

<sup>1</sup>Absolute display is the time a bit enters the modem to the time it exits the adjacent modem. This time is exclusive of any communications system propagation delays.

# SPECIFICATIONS

Performance	
Data rate:	9600 bps
Absolute delay <sup>1</sup> :	< 12 ms
Retrain time:	Typically < 1.0 sec.
Dimensions	
.75" (1.90cm) x 1.25" (3.18cm) x 3.2" (8.13cm) projection mount	
Power Requirements	
+5 Vdc from pin 1 of the DB 9 connector (< 125 milliamps drain)	
Audio	
Impedance:	600 Ohms
Levels:	Transmit -9 dBm Receive -9 to -30 dBm
Audio bandwidth:	300 - 3400 Hz (4 wire circuit)
Minimum SNR:	27 dB
Conditioning:	C4 conditioning is required for leased circuits <sup>2</sup>
Environmental	
Temperature range:	-40° to +85° C
EMI:	IEEE C37.90.2 / IEC 1000-2-2
Dielectric:	ANSI C37.90 & C37.90.1 / IEC 1000-4-4 & IEC 255-22-1
ESD	IEC 1000-4-2

<sup>1</sup>Absolute display is the time a bit enters the modem to the time it exits the adjacent modem. This time is exclusive of any communications system propagation delays.

<sup>2</sup>Consult us for leased circuit applications.

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## POWER INSTRUMENTS

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